

WHAT IS CLAIMED IS:

1. A pattern identification apparatus for identifying a predetermined pattern contained in an image, said apparatus comprising:

a storage section in which data related to said predetermined pattern is stored;

a first collation section for making comparison and collation between data related to an image in a first area greater than an area of said predetermined pattern in said image and said data related to said predetermined pattern;

a cutting section for cutting out a second area smaller than said first area from said first area based on the result of comparison carried out by said first collation section;

a second collation section for making comparison and collation between data related to an image in said second area and said data related to said predetermined pattern; and

an identification section for identifying said predetermined pattern contained in said image based on the result of comparison carried out by said second collation section.

2. The pattern identification apparatus according to claim 1, wherein said first collation section carries out comparison and collation while shifting said predetermined pattern relative to said image in said first area one unit area by one unit area which constitutes data related to said image, thereby to calculate a difference level between said image in said first area and said predetermined pattern, and said cutting section cuts out said second area based on an amount of shift of said predetermined pattern relative to said image in said first area at the time when said difference level meets a predetermined requirement.

3. The pattern identification apparatus according to claim 1, wherein said data related to said predetermined pattern stored in said storage section comprises characteristic data representative of horizontal and vertical characteristics in said predetermined pattern, said first collation section comprises a first conversion section for converting image data in said first area into characteristic data representative of horizontal and vertical characteristics, and compares and collates said characteristic data converted by said first conversion section with said characteristic data of said predetermined pattern, and said second collation section comprises a second conversion section for converting image data in said second area into characteristic data representative of horizontal and vertical characteristics, and compares and collates said characteristic data converted by said second conversion section with said characteristic data of said predetermined pattern.

4. The pattern identification apparatus according to claim 3, wherein said characteristic data obtained by said first and second conversion sections are normalized.

5. The pattern identification apparatus according to claim 1, wherein said storage section stores a plurality of kinds of different patterns as patterns to be identified.

6. The pattern identification apparatus according to claim 5, wherein said storage section stores data related to an area of each of said plurality of kinds of patterns contained in said image, and said first area is determined based on data related to said areas stored in said storage section.

7. A pattern identification apparatus for identifying a predetermined pattern contained in an image, said apparatus comprising:

a storage section in which data related to said predetermined pattern is stored;

a first cutting section for cutting out a first area greater than said predetermined pattern area from said image;

a first collation section for making comparison and collation between data related to an image in said first area and said data related to said predetermined pattern;

a second cutting section for cutting out a second area smaller than said first area from said first area based on the result of comparison carried out by said first collation section;

a second collation section for making comparison and collation between data related to an image in said second area and said data related to said predetermined pattern; and

an identification section for identifying said predetermined pattern contained in said image based on the result of comparison carried out by said second collation section.

8. The pattern identification apparatus according to claim 7, wherein said first collation section carries out comparison and collation while shifting said predetermined pattern relative to said image in said first area one unit area by one unit area which constitutes data related to said image, thereby to calculate a difference level between said image in said first area and said predetermined pattern, and said second cutting section cuts out said second area based on an amount of shift of said predetermined pattern relative to said image in said first area at the time when said difference level meets a predetermined requirement.

9. The pattern identification apparatus according to claim 7, wherein said data related to said predetermined pattern stored in said storage section comprises characteristic data representative of horizontal and vertical characteristics in said predetermined pattern, said first collation section comprises a first conversion section for converting image data in said first area into characteristic data representative of horizontal and vertical characteristics, and compares and collates said characteristic data converted by said first conversion section with said characteristic data of said predetermined pattern, and said second collation section comprises a second conversion section for converting image data in said second area into characteristic data representative of horizontal and vertical characteristics, and compares and collates said characteristic data converted by said second conversion section with said characteristic data of said predetermined pattern.

10. The pattern identification apparatus according to claim 9, wherein said characteristic data obtained by said first and second conversion sections are normalized.

11. The pattern identification apparatus according to claim 7, wherein said storage section stores a plurality of kinds of different patterns as patterns to be identified.

12. The pattern identification apparatus according to claim 11, wherein said storage section stores data related to an area of each of said plurality of kinds of patterns contained in said image, and said first area is determined based on data related to said areas stored in said storage section.

13. A pattern identification method for identifying a predetermined pattern

contained in an image, said method comprising:

a first step for registering data related to said predetermined pattern in advance;

a second step for making comparison and collation between data related to said image in a first area greater than an area of said predetermined pattern in said image and said data related to said predetermined pattern;

a third step for cutting out a second area smaller than said first area from said first area based on the result of comparison carried out in said second step;

a fourth step for making comparison and collation between data related to an image in said second area and said data related to said predetermined pattern; and

a fifth step for identifying said predetermined pattern contained in said image based on the result of comparison carried out in said fourth step.

14. The pattern identification method according to claim 13, further comprising an image pick-up step provided between said first step and said second step for obtaining said image by picking up said image by means of an image pick-up device.

15. The pattern identification method according to claim 13, wherein said second step comprises a cutting step for cutting out said first area greater than said predetermined pattern area from said image.

16. The pattern identification method according to claim 13, wherein said image contains any of a plurality of kinds of different patterns, and said plurality of kinds of different patterns are stored as predetermined patterns in said first step, and at least said second through fourth steps are repeated for

each of said plurality of kinds of different patterns.

17. A pattern identification program for identifying a predetermined pattern contained in an image, said program comprising:

a first step for registering data related to said predetermined pattern in advance;

a second step for making comparison and collation between data related to said image in a first area greater than an area of said predetermined pattern in said image and said data related to said predetermined pattern;

a third step for cutting out a second area smaller than said first area from said first area based on the result of comparison carried out in said second step;

a fourth step for making comparison and collation between data related to an image in said second area and said data related to said predetermined pattern; and

a fifth step for identifying said predetermined pattern contained in said image based on the result of comparison carried out in said fourth step; and wherein said program is executed by a computer to perform said first through fifth steps.

18. The pattern identification program according to claim 17, further comprising an image pick-up step provided between said first step and said second step for picking up said image by means of an image pick-up device, said image pick-up step being executed by said computer.

19. The pattern identification program according to claim 17, wherein said second step comprises a cutting step for cutting out said first area greater than said predetermined pattern area from said image, said cutting

step being executed by said computer.

20. The pattern identification program according to claim 17, wherein said image contains any of a plurality of kinds of different patterns, and said plurality of kinds of different patterns are stored as predetermined patterns in said first step, and said second through fourth steps are executed for each of said plurality of kinds of different patterns by said computer.

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